

REMARKSClaim Rejections Under 35 U.S.C. § 112

Examiner has asserted that the claims are not considered to be limited to purely "passive" soil vapor extraction systems because of the inclusion of a solar powered turbine. Applicant believes that this interpretation should only apply to claim 10, which is the only claim to include a solar powered turbine. Claim 10 has thus been amended accordingly.

Additionally, claims 20 and 21 have been amended to address the Examiner's rejection for indefiniteness under 35 U.S.C. § 112, second paragraph.

Claim Rejection Under 35 U.S.C. § 102

Applicant respectfully disagrees with Examiner that claim 30 of the application is anticipated by U.S. Pat. No. 5,246,309 issued to Hobby. Hobby describes a system with vent wells, return wells, and means for removal, separation and injection. The two types of return wells described in Hobby are sparge wells and vadose return wells, which the Examiner asserts are equivalent to the deep well and injection well of Applicant's invention, respectively. Both of the return wells of Hobby are meant to receive residual soil gas from an absorption tank and deliver the gas to different regions of the subsurface. The deep well of Applicant's invention is used to deliver air by way of a pressure differential to the injection well via the transfer conduit which then delivers air to the subsurface; however the deep well does not receive residual soil gas as in Hobby. Applicant has amended claim 30 to incorporate the limitations of claims 14 and 15 to reflect these differences between Hobby and Applicant's invention. Additionally, in Hobby only one return well need be present to produce the invention, whereas, both the deep well and injection well connected by the transfer conduit must be present to

produce Applicant's claim 30. Therefore, Applicant's claim 30 is patentably distinguishable from Hobby in its currently amended form.

Claim Rejections Under 35 U.S.C. § 103(a)

Applicant respectfully disagrees with Examiner's assertion that claims 1, 3, 4, 8, 9-13, and 18-29 are unpatentable over U.S. Patent No. 5,584,605 issued to Beard, et al. (Beard) in view of U.S. Patent No. 5,791,825 issued to Gardner, et al. (Gardner). The Examiner has indicated that claims 2, 5-7, and 14-17 are allowable subject matter. See Office Action dated 2/7/2005, page 6. Accordingly, Applicant has canceled claim 14, which depended on claim 1, and incorporated the limitations of claim 14 into claim 1, thereby putting claim 1 and all claims that depend on it in allowable form.

Beard is directed towards a process and equipment for removal of hydrocarbons from contaminated soil and groundwater. Specifically, Beard teaches a series of horizontal and vertical pipes. The horizontal pipes are located beneath a contaminated site and are sparged with a stripping gas such as air or carbon dioxide. The vertical pipes are likewise perforated and are either collector pipes or wash pipes. A wash solution is injected through the wash pipes into the contaminated soil and acts to displace hydrocarbon contaminants to flow toward and into the collector pipes. A pump is used to create a slight vacuum and pull the contaminants up out of the collector pipes where they are then removed from the wash solution. Beard fails to disclose utilizing a barrier to surround the contaminated site to prevent further spread of the contamination.

Gardner discloses an apparatus for building a horizontal underground barrier underneath and around an *in-situ* buried waste site. Gardner fails to teach or suggest the use of a system to remove contaminants from the waste site in combination with an underground barrier.

Examiner states that it would have been obvious to one of ordinary skill in the art to combine Beard and Gardner to arrive at the apparatus described in Applicant's original claim 1. Applicant's original claim 1 is directed to an enhanced passive soil vapor extraction system to clean a contaminated area of volatile chemicals having a deep well, injection well(s), transfer conduit, extraction well(s), and a barrier to prevent migration of chemicals outside the contaminated area. While Beard also teaches a system for the removal of contaminants from a site, it does not teach or suggest the use of a barrier to prevent the migration of volatile chemicals from the contaminated site. The barrier is a critical component to a preferred embodiment of Applicant's invention as evidenced by the original specification. See Applicant's Original Specification, p. 5, line 18-20; p. 8, line 20 to p. 9, line 1.

The Applicant respectfully suggests that it would not have been obvious to combine Beard and Gardner to arrive at the invention in Applicant's original claim 1 because obviousness cannot be established by combining teachings of the prior art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. ACS Hospitals Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577 (Fed. Cir. 1984). It is neither taught nor suggested in either Beard or Gardner that the two devices be combined to produce the Applicant's invention.

Even if the two references were combined the resulting apparatus would not be equivalent to Applicant's invention. The invention in Beard utilizes a pump to create a vacuum to pull the contaminants out of the soil, whereas Applicant uses air pressure from the deep well to push the contaminants out of the extraction well. No equivalent to Applicant's use of air pressure from within the deep well of Applicant's invention is found in the Beard patent. The deep well has been included in the invention as an alternative

to the expensive pumps or vacuums used in other systems, such as the pump found in Beard. See Applicant's Original Specification, page 10, lines 6-9. Additionally, the system in Beard utilizes a wash solution to displace hydrocarbon contaminants to flow toward the collector pipes. There is no similar solution used in Applicant's invention. Also, Beard uses gases, such as air, nitrogen or carbon dioxide, as stripping gases that are then recycled and used again after flowing through the collector pipes. The air used in Applicant's invention is dispersed with the volatilized contaminants into the atmosphere around the extraction well. This is markedly different from Beard because the gas used to push contaminants out of the soil is not collected and recycled through the system again. Therefore, because Beard and Applicant have significantly different inventions both structurally and functionally, even if the two references suggested by the Examiner were combined, they would not result in Applicant's invention.

Claims 3 and 4 are dependent on amended claim 1, which is now in allowable form by the incorporation of the limitation of allowable claim 14. Additionally, claims 3 and 4 are believed to distinguish over Beard in view of Gardner for the same reasons as recited above for claim 1. Furthermore, Beard does not teach or suggest the use of the wells in conjunction with a barrier that surrounds the wells, and therefore, does not suggest the placement of the wells within this barrier.

Claim 8, which relies on amended claim 1, is also believed to distinguish over Beard in view of Gardner for the reasons recited above for claim 1. Additionally, Gardner does not teach or suggest the use of the barrier with a process for removing contaminants from the soil; rather, Gardner is primarily concerned with the construction of a barrier to contain the contaminants from further migration. Gardner teaches that physically removing the hazardous waste is dangerous because disturbing the site could

release the contaminants into the atmosphere. Where a reference teaches away from the invention at hand, it is error to find obviousness. W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1550 (Fed. Cir. 1983). Therefore, because Gardner teaches containment of waste, rather than removal, it would not be obvious to utilize the barrier of Gardner with the removal system found in Applicant's invention.

Claim 9, which depends on amended claim 1, is also believed to distinguish over Beard in view of Gardner for the reasons recited above for claim 1. Additionally, Gardner does not teach or suggest the use of the barrier covering the land surface with a process for removing contaminants from the soil; rather, Gardner is primarily concerned with a barrier covering the land surface to prevent the hazardous contaminants from release into the atmosphere, which is one of the goals of applicants invention. Applicant's use of the barrier covering the land surface is to prevent precipitation from pooling in the soil, which would make the removal of contaminants more difficult. Therefore, because Applicant's invention is directed towards the removal of contaminants, and Gardner is directed towards the containment of hazardous materials and does not suggest the use of the land covering surface barrier in conjunction with a contaminant removal system, it would not have been obvious to create Applicant's invention.

Claim 10 is likewise dependent on amended claim 1 that is currently amended to be in allowable form. Claim 10 is also believed to distinguish over Beard in view of Gardner for the reasons recited for claim 1. Additionally, Applicant respectfully disagrees that Beard teaches a turbine as found in claim 10. Claim 10 of Applicant's invention teaches a turbine attached to the top of one or more extraction wells. Beard teaches that the collector pipes are headered together and a pump is used to create a

slight vacuum in the collector pipes. While the pump of Beard and turbines of Applicant's invention may perform similar functions, increasing airflow from the extraction wells, they do so in very different ways. Beard uses the mechanical energy of a pump to create a pressure differential, while Applicant uses the kinetic energy of wind to increase the pressure differential. A pump and turbine, either wind or solar powered, are significantly different apparatuses, and therefore, it would not have been obvious to place a turbine on the top of Applicant's extraction wells.

Claim 11 depends on amended claim 1, which is currently amended into allowable form. Claim 11 is also believed to distinguish over Beard in view of Gardner for the reasons given in the discussion of claim 1.

Claims 12 and 13 also depend on amended claim 1, which is now amended and in allowable form. Given that claims 12 and 13 are dependent upon an allowable claim, it follows that they should also be allowed. Claims 12 and 13 are additionally believed to distinguish over Beard in view of Gardner for the reasons given in the discussion of claim 1.

Claim 14 has been canceled.

Claim 18 is also dependent upon amended claim 1 which is now in allowable form, thereby making claim 18 also allowable. Additionally, Beard discloses that the horizontal sparger pipes should extend below the contaminated zone. See Beard, column 3, lines 8-11. Conversely, Applicant's vertical injection pipes extend 'into' and terminate in the waste zone. See Applicant's Original Specification, p. 11, line 13-15. Therefore, because Beard's pipes do not extend down through and terminate in the waste zone, nor does Beard suggest such a modification, it would not have been obvious to make such a modification.

Claim 19, which also relies on amended claim 1 that is now in allowable form, should also be allowable because it depends from an allowable claim. Furthermore, Beard only teaches that the collector pipes will be above the sparger pipes and groundwater, which are found below the contaminated zone. The collector pipes of Beard could therefore be found below the contaminated zone. Applicant specifically claims that the depth of the extraction wells will be equal to or above the level of the contaminants.

Claim 20 which is also dependent on amended claim 1, which is now in allowable form, should be allowed as dependent on an allowable claim. Additionally, Beard does not teach a deep well as discussed above with respect to claim 1, nor does Beard teach a deep well conduit.

Claim 21 should be allowed because it is dependent upon claim 1, which is currently in allowable form. The collector pipes (1) in Beard serve a completely different function (collect hydrocarbons) than the injection conduit in Applicant's invention (delivers pressurized air to contaminated site). It is neither suggested nor taught in Beard that an injection conduit be coupled to a transfer conduit that, in turn, is coupled to a deep well conduit. Therefore, it would not have been obvious to couple the injection conduit to the transfer conduit.

Claim 22 depends from claim 21, which is currently in allowable form because it depends from allowable claim 1, and therefore claim 22 should also be allowed.

Claim 23 also depends from currently amended claim 1, which is now in allowable form, and should be allowed for that reason.

Claim 24 has been canceled.

Claim 25 depends from claim 1, which is currently amended to be in allowable

form, and because it is dependent upon an allowable claim, claim 25 is should also be allowed.

Claim 26 depends upon claim 1, which is currently amended into an allowable form, and therefore claim 26 should be allowed. Additionally, Beard does not teach an extraction well surrounded by injection wells, rather Beard only teaches alternating extraction and injection wells. This feature is important to Applicant's invention because it increases the vacuum effect that forces soil vapor towards the extraction well. See Applicant's Original Specification, p. 11, line 17-20. Beard does not need to position the pipes to increase the vacuum effect since Beard's invention utilizes a pump to create a vacuum, which can be adjusted to increase the vacuum effect. Nor does Beard suggest the strategic placement of the pipes or the desire to increase the vacuum effect of the collector pipes. Therefore, it would not be obvious to surround an extraction well by multiple injection wells.

Claim 27 is in allowable form because it depends from claim 1, which has been amended to place it in allowable form by including the limitations of allowable claim 14.

Claim 28 also depends from claim 1, which is now in allowable form, and should therefore be allowed. Furthermore, as discussed above, Beard does not have a deep well equivalent to Applicants that could be used as a monitoring well. There is also no suggestion in Beard to use any of its well(s) in the manner suggested by Applicant. Therefore, it would not have been obvious to adapt the deep extraction well to be used as a monitoring well.

Claim 29 is also in allowable form because it depends on claim 1 that is currently amended into an allowable form. Also, it is neither taught nor suggested in Beard that the area surrounding the collector pipes could be used as a monitoring well. Therefore,

it would not have been obvious to use the extraction well as a monitoring well and claim 29 should be allowed.

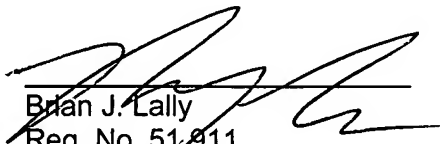
Allowable Subject Matter

Applicant kindly thanks Examiner for indicating that claims 2, 5-7 and 14-17 are allowable subject matter. Claim 1 has been rewritten to incorporate the limitations of claim 14, and therefore, claim 1 and all claims depending on claim 1 should also be allowed.

CONCLUSION

For the foregoing reasons, Applicant respectfully requests that the Examiner allow Original claims 2-9, 11-13, 15-19, 22, 23, 25-29, and Amended claims 1, 10, 20, 21, and 30 as indicated on the attached complete listing of claims.

Respectfully submitted,


Brian J. Lally
Reg. No. 51,911
U. S. Department of Energy
630-252-2042

Attachment(s)

Wednesday, March 16, 2005